# 1.0 INFORMATION UPDATE REQUEST OF THE PHASE I MEPA CERTIFICATE

## A. NEEDS ANALYSIS DISCUSSION UPDATE

### 1. Introduction

A Town wide Needs Analysis was performed to determine whether or not conventional Title 5 on-site systems will be effective in disposing of wastewater within a given study area throughout and beyond the 20 year planning period. A "Needs Area" is defined as a Study Area where a majority of the developed or developable properties located within the Study Area will not be able to utilize a conventional Title 5 septic system to effectively dispose of wastewater throughout and beyond the 20-year planning period. Data obtained from Board of Health records, Assessor's files, and soil surveys of Nantucket performed by the U.S. Department of Agriculture were used to ascertain current land uses, associated soil and groundwater conditions, and to identify wastewater disposal problem areas. The objective of the Needs Analysis was to determine the specific Study Areas where conventional Title 5 wastewater disposal systems are inadequate or conversely, where existing on-site wastewater disposal systems can remain and be effective for wastewater disposal.

A comprehensive two stage approach was utilized in the analysis consisting of: (1) a rating criteria matrix created to establish or eliminate a Study Area as a need area (community provided data); and (2) an evaluation of each Study Area based only on predominant soils classification, seasonally high groundwater level, and a combination of system age and lot size (disposal system constraint data). This type of data is specifically used when designing an on-site conventional Title 5 wastewater disposal system and is used in this study to confirm or eliminate a Study Area as a need area as determined in the First Stage Analytical Approach-Rating Criteria Matrix.

### 2. First Stage Analytical Approach - Rating Criteria Matrix

During the first stage, a rating criteria matrix was developed to evaluate the entire Island, which was broken down into eighteen Study Areas. The matrix consists of four levels of criteria that are assigned rating points. The information gathered in this first stage is the "Community" information or data on file within the community such as Board of Health Records (Title 5 reports, system repairs, system pumping records, percolation test

information), Assessor records (lot size, age, density of properties, resale records, locations to wetlands and surface water bodies) and Water Department records (aquifer protection districts, proximity to wellheads, billing records for water use). The more comprehensive data that exists on file in the community, the more detailed the first stage analysis becomes and vice versa.

The highest rating is given to actual failures compiled from Board of Health records. The second highest rating is given to categorical failures based on current Title 5 regulations. The third highest rating is given to on-site systems that are at risk for failure/noncompliance, which are on-site systems that: (1) have severe groundwater limitations; (2) have severe soil limitations; (3) have on-site systems that were built before 1978; (4) are constructed on a lot size of one-half acre or less; and/or (5) have two or more septic tank pump-outs occurring within a calendar year. The fourth highest criteria is given to on-site systems that have health/water quality issues associated with on-site systems located: (1) in a Study Area with a density of on-site systems greater than two per acre; (2) within 100 feet of a surface water body; wetland or stream; (3) located within a 100 year flood plain; and (4) within a Zone II aquifer recharge area; and (5) located within either the Nantucket Harbor Watershed or Nantucket Harbor Watershed as defined by Chapter 99 of the Town By-Laws.

This "Community" data was compiled for each delineated Study Area and criteria points were established based on the sum of this information from the matrix. For each study area, the total criteria points were divided by the number of unsewered-developed lots. This in effect "normalized" the criteria points on a per lot basis and formed a rating number for each Study Area.

A "breakpoint" in the rating numbers is established from the tabulation of all of the Study Area "rating numbers". The "breakpoint" for Nantucket is 7.33 based on the First Stage Analytical Approach-Rating Criteria Matrix.

The breakpoint was established by listing the corresponding rating number for each Study Area and calculating the difference between subsequent values. The largest differences were then studied. After reviewing this data, the 7.33 breakpoint value was selected because it best represented a threshold between specific conditions in Study Areas that are currently sewered, and thus warranted the construction of sewers in the past in Nantucket, and Study Areas that are currently unsewered.

All Study Areas with rating numbers that are greater than 7.33 were determined to be "Need Areas". The lower criteria point totals tend to reflect areas sustainable on current on-site systems whereas the highest criteria point totals tend to reflect areas that require a solution other than current on-site system. Refer to Table 1-1, Rating Criteria Points per Developed Lots. The table shows, the differences in the points per developed lots and that the breakpoint of 7.33 occurs in the Quidnet Study Area. As indicated in the preceding paragraph, review of the differences helps to set the breakpoint. The larger differences in points per developed lots represent a break in which one study area ranks significantly higher than the preceding study area listed. This break was determined to be significant in that, for example, Quidnet has more constraints in utilizing Conventional Title 5 Systems for on-site wastewater disposal than areas such as Miacomet or Surfside for example. The 7.33 break point was used to delineate the Study Areas into "No Need Areas" and "Need Areas". A second stage analytical approach was used to validate the break point assumption. Refer to Table 3D-1 from the Phase I Report.

**3. Second Stage Analytical Approach - Soils, Groundwater and Age/Lot Evaluation**

During the second stage of the analysis, each Study Area was evaluated based on predominant soil classification, groundwater levels, and a combination of system age and lot size or in total "disposal system constraint data". The three qualifying criteria are: (1) 50 percent or more of the lots within the Study Area meeting the age/lot size criteria (built before 1978 and a lot size of one-half acre or less); (2) 30 percent or more of the Study Area having severe soils limitations (hardpan, bedrock, slope, flooding and wetness); and (3) 20 percent or more of the Study Area having severe groundwater limitations (seasonally high water table at the surface to 2 feet deep). If two of these three criteria are met, then the Study Area is determined to be a need area.

**TABLE 1-1**
**TOWN OF NANTUCKET**
**CWMP/DEIR**
**RATING CRITERIA POINTS PER DEVELOPED LOT**

| Study Area | Points Per Developed Lot | Difference In Points Per Developed Lot |
|---|---|---|
| Miacomet | 1.990 | --- |
| Surfside | 2.263 | 0.273 |
| Tom Nevers Low-Density | 3.238 | 0.974 |
| Other | 3.720 | 0.482 |
| Shimmo | 4.168 | 0.448 |
| Tom Nevers High-Density | 4.475 | 0.307 |
| Siasconset | 4.519 | 0.044 |
| Town - WPZ | 4.597 | 0.078 |
| Town | 5.077 | 0.480 |
| Pocomo | 5.111 | 0.034 |
| Cisco | 5.161 | 0.050 |
| Monomoy | 6.170 | 1.009 |
| **Quidnet** | **7.333** | **1.163** |
| Somerset | 7.404 | 0.070 |
| Warren's Landing | 8.088 | 0.685 |
| Polpis | 8.186 | 0.098 |
| Madaket | 8.400 | 0.214 |
| Wauwinet | 9.260 | 0.860 |

A thorough side by side comparison of the results of the above referenced two stage evaluation methods is made to determine: (1) if a given Study Area shows consistent need; and (2) areas where there is a conflict in need (e.g. areas that show a need in one evaluation approach and no need in the other), which are then further evaluated in order to identify the real need. This comparison identifies small Sub-Study Areas, which are evaluated based on the second stage criteria, which include soils classification, groundwater levels, and a combination of system age and lot size. Utilizing these two steps provides a comprehensive approach to determine not only areas that require something other than the current on-site system, but also those areas that can sustain with their current on-site systems as a long-term wastewater solution.

**On-Site Wastewater Disposal System Age**

On-site wastewater disposal systems built before 1978 have a very high likelihood of failure due to the lack of design and construction controls placed on these systems prior to this date. If a developed lot had an on-site wastewater disposal system that was built before 1978, the system today would most likely fail a current Title 5 inspection. In 1978, Title 5 Regulations were promulgated by DEP and the local Boards of Health were required to enforce these regulations. The significance of this date is that prior to 1978, there were rules pertaining to the design and construction monitoring of on-site wastewater disposal systems, but these requirements were significantly less stringent and enforcement by the State Department of Public Health was ineffective.

**Lot Size**

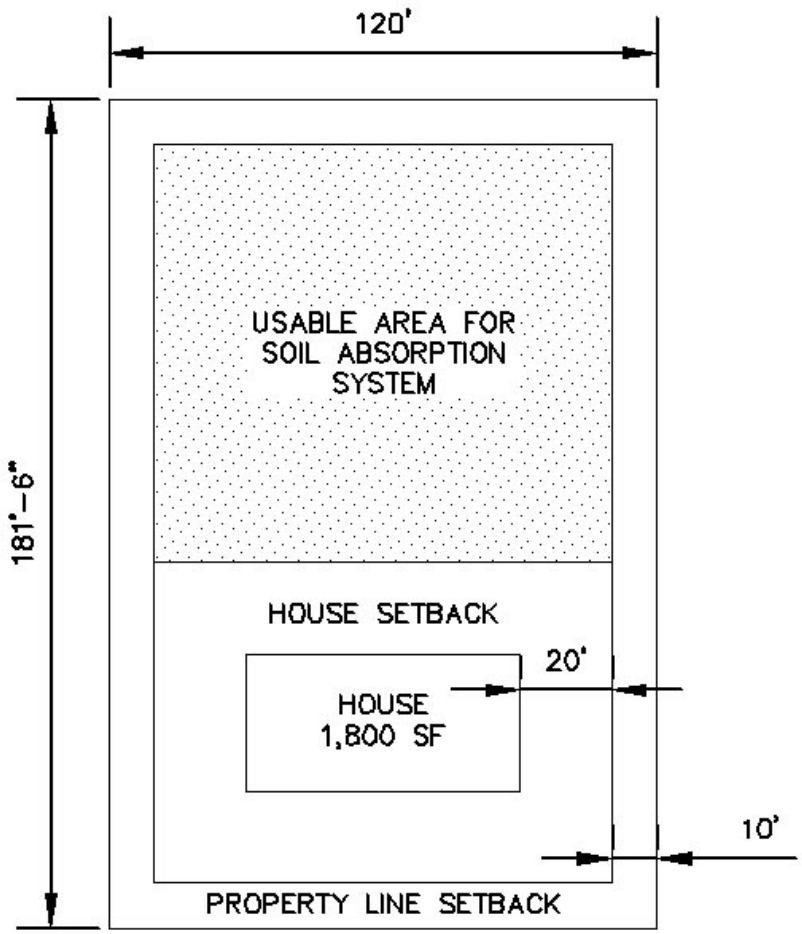
Lot size will have a direct affect on whether or not a failed on-site wastewater disposal system can be repaired to meet current Title 5 criteria. It is a reasonable assumption that under less than ideal soil and groundwater conditions, all lots of one-half acre or less in an area would, as a minimum, require a variance to Title 5 in order to repair the on-site wastewater disposal system.

To better describe how lot size will affect the ability to repair an existing failed on-site wastewater disposal system, consider the following scenario: a one-half acre lot with typical dwelling, property line and structure setbacks along with Title 5 setbacks is shown in Figure 1-1. If the soils and groundwater levels are not problematic there is about 9,150 square feet available for a soil absorption system. A typical soil absorption system servicing a four-bedroom single-family residence generating 440 gallon per day of wastewater being disposed into the ground with a percolation rate of 10 minutes per inch will require about 2,500 square feet. If an on-site wastewater disposal system under the same general conditions has to be mounded, due to high groundwater, the land area required to build this system is about 4,400 square feet.

- If 30 percent of the one-half acre lot has severe soil limitations (hardpan, bedrock, etc.) the useable land for a new on-site system is reduced to less than 2,500 square feet.

- If 20 percent of the one-half acre lot has severe groundwater limitations (seasonally high groundwater level at the surface to 2 feet below grade) the useable land for a new on-site system is reduced to less than 4,400 square feet.

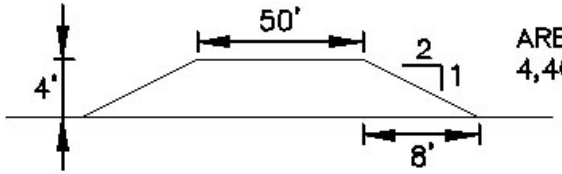
NAME 27355LOTSIZE.dwg DATE: 9/30/03 MWeaver




| | AREA (SQ FT) |
|---|---|
| LOT SIZE (120' x 181.5') | 21,780 |
| SETBACK FROM PROPERTY LINE (10') | |
| 10' x 120' x 2 | |
| 10' x (181.5' – 20') x 2 | 5,630 |
| HOUSE | 1,800 |
| SETBACK FROM HOUSE (20') | |
| 20' x 100' x 2 | |
| 20' x 30' x 2 | 5,200 |
| USABLE LAND | 9,150 |
| AVERAGE SYSTEM SIZE | |
| 440 GPD | |
| PERC RATE – 10 MIN/IN | 2,500 |

IF SEVERE SOIL LIMITATION IS 30%, USABLE LAND IS REDUCED TO LESS THAN 2,500 SF.

IF SEVERE GROUNDWATER LIMITATION IS 20%, USABLE LAND IS REDUCED TO LESS THAN 4,400 SF ASSUMING SYSTEM IS MOUNDED.




AREA REQUIRED 4,400± SF.

FIGURE NO. 1–1
TYPICAL LOT CONFIGURATION
COMPREHENSIVE WASTEWATER MANAGEMENT PLAN

EARTH TECH

**Combination Age and Lot Size Criteria**

If 50 percent or more of the properties within a study area have an on-site system that was built before 1978 and a lot of one-half acre or less, then the age/lot size criteria has been met. The percentage was chosen as it represents that the majority of the study area has a small lot size and an outdated on-site wastewater disposal system.

**Severe Soils Criteria**

If 30 percent or more of the soils within a study area classified as having severe limitations (hardpan, bedrock, slope, high permeability sands, flooding and wetness) the severe soils criteria has been met. The percentage represents the maximum amount of severe soils that can be present on a lot and still construct a conventional Title 5 system. Soil types were obtained from the Soil Survey Report by the U.S. Department of Agriculture.

**Severe Groundwater Criteria**

If 20 percent or more of a study area is classified as having a "moderately shallow" to "shallow" (high water table at the surface to 2 feet deep) seasonally high groundwater level the severe groundwater criteria has been met. The percentage represents the maximum amount of severe groundwater that can be present on a lot and still construct a conventional Title 5 system. High groundwater levels were obtained from the Soil Survey Report by the U.S. Department of Agriculture.

**Need Determination**

As per the Second Stage Analytical Approach, if two of the three criteria are met then the study area qualifies as a "Need Area". As previously discussed, the three criteria are: (1) having 50 percent or more of the properties within the study area meeting the age/lot size criteria (built before 1978 and a lot size of one-half acre or less); (2) having 30 percent or more of the study area with severe soils limitations (hardpan, bedrock, slope, high permeability sands, flooding and wetness); and (3) having 20 percent or more of the study area with severe groundwater limitations (seasonally high water table at the surface to 2 feet below grade).

If this hypothetical one-half acre lot had an on-site wastewater disposal system that failed and the property was developed before 1978 and the lot has either 30 percent severe soils or 20 percent high groundwater, the existing system could not be repaired using a conventional Title 5 system.

The options for a solution for this system would be either: (1) allowing variances to the conventional Title 5 system; (2) on-site innovative-alternative systems;(3) communal wastewater treatment and disposal; (4) local wastewater treatment and (5) regional wastewater treatment. Of these alternatives, the recommended solution for each study area with wastewater disposal needs will be presented in Phase II of the CWMP, based on comprehensive technical, environmental, and financial considerations.

Refer to Table 1-2 for a summary of the results from the rating criteria matrix for the entire Town from the Phase I Report on the next few pages. This shows all the criteria used for evaluation and exactly how it applied to each of the eighteen Study Areas in Town.

## 4. Results of Needs Analysis

The final results are summarized below for each study area.

### Madaket

This study area is comprised of 394 acres of which approximately 232 acres are currently developed. There are 435 developed lots located in this study area. The average age of the residential units is 30 years. This study area is about 50 percent developed. About 22 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 30 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade). Approximately 435 systems fall within 3,600 feet of Madaket Harbor.

Between 1972 and 1999, there were 105 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 44 percent, based on 70 resales.

**TABLE 3D-2**

**CWMP/EIR**

**TOWN OF NANTUCKET, MASSACHUSETTS**

**RATING CRITERIA**

| CRITERIA NAME | | DESCRIPTION | Madaket | | Warren's Landing | | Cisco | | Somerset | | Miacomet | | Surfside | | Tom Nevers Hi-Density | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points |
| CRITERIA POINTS | | Total Number of Lots | 864 | | 99 | | 204 | | 206 | | 127 | | 419 | | 350 | |
| Actual Failure | 4 | Total Number of Developed Lots | 435 | | 68 | | 143 | | 161 | | 101 | | 281 | | 255 | |
| Imminent Failure | 3 | Total Number of Unsewered Developed Lots | 435 | | 68 | | 143 | | 161 | | 101 | | 281 | | 255 | |
| High Likelihood of Imminent Failure | 2 | Number of Resales since 3/31/95 | 70 | | 19 | | 27 | | 30 | | 15 | | 44 | | 26 | |
| Health / Water Quality Issue | 1 | Number of Acres per Study Area | 394 | | 49 | | 355 | | 151 | | 296 | | 685 | | 129 | |
| | | Number of Net Acres for Developed Lots | 232 | | 26 | | 143 | | 103 | | 197 | | 363 | | 63 | |
| | | No. of Acres of Severe Groundwater Limitation | 117 | | 10 | | 27 | | 7 | | 8 | | 49 | | 28 | |
| | | Number of Acres of Severe Soil Limitation | 86 | | 26 | | 178 | | 96 | | 149 | | 112 | | 61 | |
| Actual Failure | | 3/31/95 to 1999 | 31 | 124 | 4 | 16 | 8 | 32 | 21 | 84 | 8 | 32 | 21 | 84 | 2 | 8 |
| | | 1972 to 3/31/95 | 74 | 296 | 2 | 8 | 10 | 40 | 8 | 32 | 6 | 24 | 27 | 108 | | 0 |
| | | | 105 | 420 | 6 | 24 | 18 | 72 | 29 | 116 | 14 | 56 | 48 | 192 | 2 | 8 |
| | | Adjusted Total based on Developed/Unsewered Developed Ratio | | 420 | | 24 | | 72 | | 116 | | 56 | | 192 | | 8 |
| Imminent Failure | | System within Zone I Aquifer Recharge Area | 9 | 27 | | 0 | 6 | 18 | 1 | 3 | | 0 | 11 | 33 | | 0 |
| | | System within 50 feet of Private Drinking Water Well | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | System within 100 feet of Public Drinking Water Supply | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Developed Lots with Less than 10,000 sq. ft. of area per Bedro | 260 | 780 | 66 | 198 | 105 | 315 | 152 | 456 | | 0 | | 0 | 110 | 330 |
| | | | 269 | 807 | 66 | 198 | 111 | 333 | 153 | 459 | 0 | 0 | 11 | 33 | 110 | 330 |
| High Likelihood of Imminent Failure | | Lots with Severe Groundwater Limitation | 130 | 260 | 14 | 28 | 11 | 22 | 8 | 16 | 3 | 6 | 20 | 40 | 54 | 108 |
| | | Systems Built before 1978 (Title 5) | 281 | 562 | 1 | 2 | 43 | 86 | 13 | 26 | 15 | 30 | 72 | 144 | 2 | 4 |
| | | Lot Size less than or equal to 1/2 acre | 246 | 492 | 62 | 124 | 34 | 68 | 100 | 200 | 2 | 4 | 52 | 104 | 97 | 194 |
| | | Lots with Severe Soil Limitation | 95 | 190 | 36 | 72 | 72 | 144 | 103 | 206 | 51 | 102 | 46 | 92 | 121 | 242 |
| | | Pumpouts Greater than 2 times per year | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | | 752 | 1,504 | 113 | 226 | 160 | 320 | 224 | 448 | 71 | 142 | 190 | 380 | 274 | 548 |
| Health / Water Quality Issue | | Density of Systems Greater Than 2 per Acre | 435 | 435 | 68 | 68 | 0 | 0 | 161 | 161 | 0 | 0 | 0 | 0 | 255 | 255 |
| | | System within 100 feet of Surface Water Body, Wetlands or Streams | | 0 | | 0 | 7 | 7 | 8 | 8 | 3 | 3 | 3 | 3 | | 0 |
| | | System located within 100 Year Flood Plain | 53 | 53 | | 0 | 6 | 6 | | 0 | | 0 | | 0 | | 0 |
| | | System within Zone II Aquifer Recharge Area | | 0 | | 0 | | 0 | | 0 | | 0 | 28 | 28 | | 0 |
| | | System within Harbor Watershed Line or 3,600' of Madaket Ha | 435 | 435 | 34 | 34 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | | 923 | 923 | 102 | 102 | 13 | 13 | 169 | 169 | 3 | 3 | 31 | 31 | 255 | 255 |
| | | Total Criteria Points for Study Area | | 3,654 | | 550 | | 738 | | 1,192 | | 201 | | 636 | | 1,141 |
| | | Rating Criteria Points Per Developed Lot | | 8.40 | | 8.09 | | 5.16 | | 7.40 | | 1.99 | | 2.26 | | 4.47 |
| | | **RECOMMENDED AS A NEED AREA** | | **YES** | | **YES** | | **NO** | | **YES** | | **NO** | | **NO** | | **NO** |

**(Conventional Title 5 System Not Feasible for Majority of Study Area)**

**TABLE 3D-2 (Continued)**
**CWMP/EIR**
**TOWN OF NANTUCKET, MASSACHUSETTS**
**RATING CRITERIA**

| CRITERIA NAME | | DESCRIPTION | ›m Nevers Lo-Density | | Siasconset | | Quidnet | | Wauwinet | | Pocomo | | Polpis | | Town | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points |
| CRITERIA POINTS | | Total Number of Lots | 195 | | 1,049 | | 77 | | 68 | | 140 | | 100 | | 4,741 | |
| Actual Failure | 4 | Total Number of Developed Lots | 122 | | 664 | | 45 | | 50 | | 81 | | 59 | | 3,943 | |
| Imminent Failure | 3 | Total Number of Unsewered Developed Lots | 122 | | 127 | | 45 | | 50 | | 81 | | 59 | | 890 | |
| High Likelihood of Imminent Failure | 2 | Number of Resales since 3/31/95 | 48 | | 27 | | 9 | | 3 | | 11 | | 10 | | 108 | |
| Health / Water Quality Issue | 1 | Number of Acres per Study Area | 653 | | 1,012 | | 68 | | 61 | | 457 | | 583 | | 1,922 | |
| | | Number of Net Acres for Developed Lots | 374 | | 349 | | 45 | | 51 | | 297 | | 395 | | 1,333 | |
| | | No. of Acres of Severe Groundwater Limitation | 31 | | 291 | | 22 | | 29 | | 162 | | 324 | | 419 | |
| | | Number of Acres of Severe Soil Limitation | 286 | | 479 | | 19 | | 9 | | 163 | | 371 | | 1,076 | |
| Actual Failure | | 3/31/95 to 1999 | 13 | 52 | 3 | 12 | 7 | 28 | 3 | 12 | 6 | 24 | 10 | 40 | 43 | 172 |
| | | 1972 to 3/31/95 | 15 | 60 | 15 | 60 | 13 | 52 | 11 | 44 | 9 | 36 | 12 | 48 | 99 | 396 |
| | | | 28 | 112 | 18 | 72 | 20 | 80 | 14 | 56 | 15 | 60 | 22 | 88 | 142 | 568 |
| | | Adjusted Total based on Developed/Unsewered Developed Ratio | | 112 | | 376 | | 80 | | 56 | | 60 | | 88 | | 2,516 |
| Imminent Failure | | System within Zone I Aquifer Recharge Area | | 0 | 2 | 6 | | 0 | 28 | 84 | | 0 | | 0 | | 0 |
| | | System within 50 feet of Private Drinking Water Well | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | System within 100 feet of Public Drinking Water Supply | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Developed Lots with Less than 10,000 sq. ft. of area per Bedroom | | 0 | | 0 | 21 | 63 | 21 | 63 | 8 | 24 | 6 | 18 | 60 | 180 |
| | | | 0 | 0 | 2 | 6 | 21 | 63 | 49 | 147 | 8 | 24 | 6 | 18 | 60 | 180 |
| High Likelihood of Imminent Failure | | Lots with Severe Groundwater Limitation | 6 | 12 | 191 | 382 | 15 | 30 | 24 | 48 | 29 | 58 | 33 | 66 | 859 | 1,718 |
| | | Systems Built before 1978 (Title 5) | 42 | 84 | 461 | 922 | 30 | 60 | 42 | 84 | 41 | 82 | 40 | 80 | 2,439 | 4,878 |
| | | Lot Size less than or equal to 1/2 acre | 37 | 74 | 512 | 1,024 | 22 | 44 | 8 | 16 | 8 | 16 | 10 | 20 | 3,098 | 6,196 |
| | | Lots with Severe Soil Limitation | 53 | 106 | 60 | 120 | 12 | 24 | 8 | 16 | 29 | 58 | 38 | 76 | 498 | 996 |
| | | Pumpouts Greater than 2 times per year | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | | 138 | 276 | 1,224 | 2,448 | 79 | 158 | 82 | 164 | 107 | 214 | 121 | 242 | 6,894 | 13,788 |
| Health / Water Quality Issue | | Density of Systems Greater Than 2 per Acre | 0 | 0 | 127 | 127 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 890 | 890 |
| | | System within 100 feet of Surface Water Body, Wetlands or Str | 5 | 5 | 29 | 29 | 28 | 28 | 33 | 33 | 27 | 27 | 60 | 60 | 447 | 447 |
| | | System located within 100 Year Flood Plain | 2 | 2 | 1 | 1 | 1 | 1 | 13 | 13 | 8 | 8 | 16 | 16 | 65 | 65 |
| | | System within Zone II Aquifer Recharge Area | | 0 | 13 | 13 | | 0 | | 0 | | 0 | | 0 | 161 | 161 |
| | | System within Harbor Watershed Line or 3,600' of Madaket Harbor | | 0 | | 0 | | 0 | 50 | 50 | 81 | 81 | 59 | 59 | 1,972 | 1,972 |
| | | | 7 | 7 | 170 | 170 | 29 | 29 | 96 | 96 | 116 | 116 | 135 | 135 | 3,535 | 3,535 |
| | | Total Criteria Points for Study Area | | 395 | | 3,000 | | 330 | | 463 | | 414 | | 483 | | 20,019 |
| | | Rating Criteria Points Per Developed Lot | | 3.24 | | 4.52 | | 7.33 | | 9.26 | | 5.11 | | 8.19 | | 5.08 |
| | | **RECOMMENDED AS A NEED AREA** | | **NO** | | **NO** | | **YES** | | **YES** | | **NO** | | **YES** | | **NO** |

**(Conventional Title 5 System Not Feasible for Majority of Study Area)**

**TABLE 3D-2 (Continued)**
**CWMP/EIR**
**TOWN OF NANTUCKET, MASSACHUSETTS**
**RATING CRITERIA**

| CRITERIA NAME | | DESCRIPTION | Town - WPZ | | Shimmo | | Monomoy | | Other | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points | Number | Points |
| CRITERIA POINTS | | Total Number of Lots | 743 | | 284 | | 263 | | 2,539 | | 0 | | 0 | | 0 | |
| Actual Failure | 4 | Total Number of Developed Lots | 524 | | 137 | | 184 | | 818 | | 0 | | 0 | | 0 | |
| Imminent Failure | 3 | Total Number of Unsewered Developed Lots | 315 | | 137 | | 178 | | 812 | | 0 | | 0 | | 0 | |
| High Likelihood of Imminent Failure | 2 | Number of Resales since 3/31/95 | 37 | | 21 | | 19 | | 114 | | | | | | | |
| Health / Water Quality Issue | 1 | Number of Acres per Study Area | 744 | | 881 | | 276 | | 21,863 | | 0 | | 0 | | 0 | |
| | | Number of Net Acres for Developed Lots | 313 | | 380 | | 218 | | 5,422 | | 0 | | 0 | | 0 | |
| | | No. of Acres of Severe Groundwater Limitation | 7 | | 171 | | 44 | | 5,263 | | 0 | | 0 | | 0 | |
| | | Number of Acres of Severe Soil Limitation | 321 | | 230 | | 150 | | 7,538 | | 0 | | 0 | | 0 | |
| Actual Failure | | 3/31/95 to 1999 | 23 | 92 | 9 | 36 | 17 | 68 | 60 | 240 | | 0 | | 0 | | 0 |
| | | 1972 to 3/31/95 | 24 | 96 | 17 | 68 | 30 | 120 | 110 | 440 | | 0 | | 0 | | 0 |
| | | | 47 | 188 | 26 | 104 | 47 | 188 | 170 | 680 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Adjusted Total based on Developed/Unsewered Developed Ratio | | 313 | | 104 | | 194 | | 685 | | 0 | | 0 | | 0 |
| Imminent Failure | | System within Zone I Aquifer Recharge Area | | 0 | | 0 | | 0 | 10 | 30 | | 0 | | 0 | | 0 |
| | | System within 50 feet of Private Drinking Water Well | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | System within 100 feet of Public Drinking Water Supply | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | Developed Lots with Less than 10,000 sq. ft. of area per Bedro | 137 | 411 | 33 | 99 | 37 | 111 | | 0 | | 0 | | 0 | | 0 |
| | | | 137 | 411 | 33 | 99 | 37 | 111 | 10 | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| High Likelihood of Imminent Failure | | Lots with Severe Groundwater Limitation | 5 | 10 | 27 | 54 | 29 | 58 | 197 | 394 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Systems Built before 1978 (Title 5) | 74 | 148 | 40 | 80 | 108 | 216 | 337 | 674 | | 0 | | 0 | | 0 |
| | | Lot Size less than or equal to 1/2 acre | 229 | 458 | 4 | 8 | 29 | 58 | 73 | 146 | | 0 | | 0 | | 0 |
| | | Lots with Severe Soil Limitation | 136 | 272 | 36 | 72 | 97 | 194 | 280 | 560 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Pumpouts Greater than 2 times per year | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | | | 444 | 888 | 107 | 214 | 263 | 526 | 887 | 1,774 | 0 | 0 | 0 | 0 | 0 | 0 |
| Health / Water Quality Issue | | Density of Systems Greater Than 2 per Acre | 315 | 315 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | System within 100 feet of Surface Water Body, Wetlands or Str | 9 | 9 | 43 | 43 | | 0 | 204 | 204 | | 0 | | 0 | | 0 |
| | | System located within 100 Year Flood Plain | | 0 | 5 | 5 | 4 | 4 | 72 | 72 | | 0 | | 0 | | 0 |
| | | System within Zone II Aquifer Recharge Area | 473 | 473 | 3 | 3 | 116 | 116 | 117 | 117 | | 0 | | 0 | | 0 |
| | | System within Harbor Watershed Line or 3,600' of Madaket Harbor | | 0 | 103 | 103 | 184 | 184 | 161 | 161 | | 0 | | 0 | | 0 |
| | | | 797 | 797 | 154 | 154 | 304 | 304 | 554 | 554 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Total Criteria Points for Study Area | | 2,409 | | 571 | | 1,135 | | 3,043 | | 0 | | 0 | | 0 |
| | | Rating Criteria Points Per Developed Lot | | 4.60 | | 4.17 | | 6.17 | | 3.72 | | 0.00 | | 0.00 | | 0.00 |
| | | **RECOMMENDED AS A NEED AREA** | | **NO** | | **NO** | | **NO** | | **NO** | | **NO** | | **NO** | | **NO** |

**(Conventional Title 5 System Not Feasible for Majority of Study Area)**

This study area has a criteria point rating of 8.40 per developed lot, which is above the threshold of 7.33. The properties within this study area have the following characteristics: approximately 46 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 22 percent have poor soils; and approximately 30 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented in Phase II of the CWMP/EIR, based on comprehensive technical, environmental, and financial considerations.

**Warren's Landing**

This study area is comprised of 49 acres of which approximately 26 acres are currently developed. There are 68 developed lots located in this study area. The average age of the residential units is 10 years. This study area is about 69 percent developed. Approximately 53 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and 221 percent of this study area is classified as having moderate to severe groundwater levels (i.e. seasonally high water table varies from the ground surface to two feet below grade). Approximately 34 systems fall within 3,600 feet of Madaket Harbor.

Between 1973 and 1999, there were 6 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 21 percent, based on 19 resales.

This study area has a criteria point rating of 8.08 per developed lot, which is above the threshold of 7.33. The properties within this study area have the following characteristics: no properties were developed before 1978 and had a lot size of one-half acre or less; approximately 53 percent have poor soils; and approximately 21 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented in Phase II of the CWMP/EIR, based on comprehensive technical, environmental, and financial considerations.

**Cisco**

This study area is comprised of 355 acres of which approximately 143 acres are currently developed. There are 143 developed lots located in this study area. The average age of the residential units is 19 years. This study area is about 70 percent developed. About 50 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 8 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 18 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 30 percent, based on 27 unsewered resales.

This study area has a criteria point rating of 5.16 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 9 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 50 percent have poor soils; and approximately 8 percent have high groundwater.

Conventional Title 5 septic systems are the recommended long-term wastewater disposal solution for this study area. This study area should be maintained in accordance with the Town's Septage Management Plan.

**Somerset**

This study area is comprised of 151 acres of which approximately 103 acres are currently developed. There are 161 developed lots located in this study area. The average age of the residential units is 12 years. This study area is about 78 percent developed. About 64 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 5 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 29 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 73 percent, based on 30 resales.

This study area has a criteria point rating of 7.40 per developed lot, which is above the threshold of 7.33. The properties within this study area have the following characteristics: approximately 1 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 64 percent have poor soils; and approximately 5 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented in Phase II of the CWMP/EIR, based on comprehensive technical, environmental, and financial considerations.

**Miacomet**

This study area is comprised of 296 acres of which approximately 197 acres are currently developed. There are 101 developed lots located in this study area. The average age of the residential units is 14 years. This study area is about 79 percent developed. About 51 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 3 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 14 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 53 percent, based on 15 resales.

This study area has a criteria point rating of 1.99 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 1 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 51 percent have poor soils; and approximately 3 percent have high groundwater.

Conventional Title 5 septic systems are the recommended long-term wastewater disposal solution for this study area. This study area should be maintained in accordance with the Town's Septage Management Plan.

**Surfside**

This study area is comprised of 685 acres of which approximately 363 acres are currently developed. There are 281 developed lots located in this study area. The average age of the residential units is 19 years. This study area is about 67 percent developed. About 16 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 7 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 48 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 48 percent, based on 44 resales.

This study area has a criteria point rating of 2.26 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 9 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 16 percent have poor soils; and approximately 7 percent have high groundwater.

Conventional Title 5 septic systems are the recommended long-term wastewater disposal solution for this study area. This study area should be maintained in accordance with the Town's Septage Management Plan.

**Tom Nevers – High Density**

This study area is comprised of 129 acres of which approximately 63 acres are currently developed. There are 255 developed lots located in this study area. The average age of the residential units is 8 years. This study area is about 73 percent developed. About 47 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 21 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 2 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 8 percent, based on 26 resales.

This study area has a criteria point rating of 4.48 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 1 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 47 percent have poor soils; and approximately 21 percent have high groundwater.

Conventional Title 5 septic systems are the recommended long-term wastewater disposal solution for this study area. This study area should be maintained in accordance with the Town's Septage Management Plan.

**Tom Nevers – Low Density**

This study area is comprised of 653 acres of which approximately 374 acres are currently developed. There are 122 developed lots located in this study area. The average age of the residential units is 15 years. This study area is about 63percent developed. About 44 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 5 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 28 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 27 percent, based on 48 resales.

This study area has a criteria point rating of 3.24 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 3 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 44 percent have poor soils; and approximately 5 percent have high groundwater.

Conventional Title 5 septic systems are the recommended long-term wastewater disposal solution for this study area. This study area should be maintained in accordance with the Town's Septage Management Plan.

**Siasconset**

This study area is comprised of 1,012 acres of which approximately 349 acres are currently developed. There are 664 developed lots located in this study area of which 127 are currently unsewered. The average age of the residential units is 56 years. This study area is about 63 percent developed with approximately 81 percent of the developed lots connected to the existing wastewater collection system. About 47 percent of the soils

in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 29 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 18 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 11 percent, based on 27 resales of unsewered developed lots.

This study area has a criteria point rating of 4.52 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 53 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 47 percent have poor soils; and approximately 29 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area since a majority of the study area is currently provided with wastewater collection, treatment and disposal.

**Quidnet**

This study area is comprised of 68 acres of which approximately 45 acres are currently developed. There are 45 developed lots located in this study area. The average age of the residential units is 47 years. This study area is about 58 percent developed. About 28 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 32 percent of this study area is classified as having moderate to severe groundwater levels (i.e. seasonally high water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 20 reported on-site wastewater disposal system upgrades or repairs in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 78 percent, based on 9 resales.

This study area has a criteria point rating of 7.33 per developed lot, which is at he threshold of 7.33. The properties within this study area have the following characteristics: approximately 36 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 28 percent have poor soils; and approximately 32 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented after the results of the Massachusetts Estuary Project is completed and will be based on comprehensive technical, environmental, and financial considerations.

**Wauwinet**

This study area is comprised of 61 acres of which approximately 51 acres are currently developed. There are 50 developed lots located in this study area. The average age of the residential units is 46 years. This study area is about 74 percent developed. About 15 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 47 percent of this study area is classified as having moderate to severe groundwater levels (i.e. seasonally high water table varies from the ground surface to two feet below grade). Approximately 50 systems are within the Harbor Watershed Line.

Between 1972 and 1999, there were 14 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 Regulations came into effect on March 31, 1995, the failure rate in this study area is 100 percent, based on 3 resales.

This study area has a criteria point rating of 9.26 per developed lot, which is above the threshold of 7.33. The properties within this study area have the following characteristics: approximately 10 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 15 percent have poor soils; and approximately 47 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented after the results of the Massachusetts Estuary Project is completed and will be based on comprehensive technical, environmental, and financial considerations.

**Pocomo**

This study area is comprised of 457 acres of which approximately 297 acres are currently developed. There are 81 developed lots located in this study area. The average age of the residential units is 24 years. This study area is about 58 percent developed. About 36 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 35 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade). Approximately 81 systems are within the Harbor Watershed Line.

Between 1972 and 1999, there were 15 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 55 percent, based on 11 resales.

This study area has a criteria point rating of 5.11 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 6 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 36 percent have poor soils; and approximately 35 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area since the study area abuts the Town Harbor and is entirely located within the Harbor Watershed Area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these

alternatives, the recommended solution for this study area will be presented after the results of the Massachusetts Estuary Project is completed and will be based on comprehensive technical, environmental, and financial considerations.

**Polpis**

This study area is comprised of 583 acres of which approximately 395 acres are currently developed. There are 59 developed lots located in this study area. The average age of the residential units is 44 years. This study area is about 59 percent developed. About 64 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 56 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade). Approximately 59 systems are within the Harbor Watershed Line.

Between 1972 and 1999, there were 22 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area is 100 percent, based on 10 resales.

This study area has a criteria point rating of 8.19 per developed lot, which is above the threshold of 7.33. The properties within this study area have the following characteristics: approximately 15 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 64 percent have poor soils; and approximately 56 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented after the results of the Massachusetts Estuary Project is completed and will be based on comprehensive technical, environmental, and financial considerations.

**Town**

This study area is comprised of 1,922 acres of which approximately 1,333 acres are currently developed. There are 3,943 developed lots located in this study area of which 890 are currently unsewered. The average age of the residential units is 64 years. This study area is about 83 percent developed with approximately 77 percent of the developed lots connected to the existing wastewater collection system. About 56 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 22 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade). Approximately 1972 systems are within the Harbor Watershed Line.

Between 1972 and 1999, there were 142 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 40 percent, based on 108 resales of unsewered developed lots.

This study area has a criteria point rating of 5.08 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 47 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 56 percent have poor soils; and approximately 22 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area since a majority of the study area is currently provided with wastewater collection, treatment and disposal.

**Town - WPZ**

This study area is comprised of 744 acres of which approximately 313 acres are currently developed. This area encompasses the Wellhead Protection Overlay Zone. There are 524 developed lots located in this study area of which 315 are currently unsewered. The average age of the residential units is 15 years. This study area is about 71 percent developed with approximately 40 percent of the developed lots connected to the existing wastewater collection system. About 43 percent of the soils in this study area are

classified as severe (hardpan, bedrock, slope, high permeability sands, flooding and wetness) and about 1 percent of this study area is classified as having moderate to severe groundwater levels (i.e. water table varies from the ground surface to two feet below grade).

Between 1972 and 1999, there were 47 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 62 percent, based on 37 resales of unsewered developed lots.

This study area has a criteria point rating of 4.60 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 6 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 43 percent have poor soils; and approximately 1 percent have high groundwater.

Conventional Title 5 septic systems will be considered as the long-term wastewater disposal solution for portions of this study area as this study area is located within the Wellhead Protection Overlay Zone and approximately 40 percent is of the study area is currently provided with wastewater collection, treatment and disposal. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented in Phase II of the CWMP/EIR, based on comprehensive technical, environmental, and financial considerations. For those areas with on-site wastewater disposal systems, they will continue to be the recommended long-term solution for this study area. This study area should be maintained in accordance with the Town's Septage Management Plan.

**Shimmo**

This study area is comprised of 881 acres of which approximately 380 acres are currently developed. There are 137 developed lots located in this study area. The average age of the residential units is 21 years. This study area is about 48 percent developed. About 26 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope,

high permeability sands, flooding and wetness) and about 19 percent of this study area is classified as having moderate to severe groundwater levels (i.e. seasonally high water table varies from the ground surface to two feet below grade). Approximately 103 systems are located within the Harbor Watershed Line.

Between 1972 and 1999, there were 26 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 43 percent, based on 21 resales.

This study area has a criteria point rating of 4.17 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 1 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 26 percent have poor soils; and approximately 19 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area since the study area abuts the Town Harbor and approximately 75 percent is located within the Harbor Watershed Area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented in Phase II of the CWMP/EIR, based on comprehensive technical, environmental, and financial considerations.

**Monomoy**

This study area is comprised of 276 acres of which approximately 218 acres are currently developed. There are 184 developed lots located in this study area of which 178 are currently unsewered. The average age of the residential units is 29 years. This study area is about 70 percent developed with approximately 3 percent of the developed lots connected to the existing wastewater collection system. About 54 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability sands,

flooding and wetness) and about 16 percent of this study area is classified as having moderate to severe groundwater levels (i.e. seasonally high water table varies from the ground surface to two feet below grade). Approximately 184 systems are located within the Harbor Watershed Line.

Between 1972 and 1999, there were 47 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 90 percent, based on 19 resales of unsewered developed lots.

This study area has a criteria point rating of 6.17 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 14 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 54 percent have poor soils; and approximately 16 percent have high groundwater.

Conventional Title 5 septic systems are not the recommended long-term wastewater disposal solution for this study area since the study area abuts the Town Harbor and is entirely located within the Harbor Watershed Area. On-site innovative alternative systems, local or satellite wastewater disposal systems are all presently viable alternatives for effectively addressing the wastewater disposal needs in this study area. Of these alternatives, the recommended solution for this study area will be presented in Phase II of the CWMP/EIR, based on comprehensive technical, environmental, and financial considerations.

**Remaining Island**

This study area is comprised of 21,863 acres of which approximately 5,422 acres are currently developed. There are 818 developed lots located in this study area of which 812 are currently unsewered. The average age of the residential units is 26 years. This study area is about 32 percent developed with approximately 1 percent of the developed lots connected to the existing wastewater collection system. About 35 percent of the soils in this study area are classified as severe (hardpan, bedrock, slope, high permeability

sands, flooding and wetness) and about 24 percent of this study area is classified as having moderate to severe groundwater levels (i.e. seasonally high water table varies from the ground surface to two feet below grade). Approximately 161 systems are located within the Harbor Watershed Line.

Between 1972 and 1999, there were 170 reported on-site wastewater disposal system repairs or upgrades in this study area. Since the revised Title 5 regulations came into effect on March 31, 1995, the failure rate in this study area has been approximately 53 percent, based on 114 resales of unsewered developed lots.

This study area has a criteria point rating of 3.72 per developed lot, which is below the threshold of 7.33. The properties within this study area have the following characteristics: approximately 5 percent were developed before 1978 and have a lot size of one-half acre or less; approximately 35 percent have poor soils; and approximately 24 percent have high groundwater.

Conventional Title 5 septic systems are the recommended long-term wastewater disposal solution for this study area. This study area should be maintained in accordance with the Town's Septage Management Plan.

Of the eighteen studies areas, seven study areas have been identified as having a need or are currently located within the existing service are, while the remaining study areas can be maintained in accordance with the Town's Septage Management Plan. Refer to Table 1-3 for a summary of the Needs Analysis.

## B. WASTEWATER FLOW UPDATE

In the Phase I Report, wastewater flows were estimated for each study area for both the initial and design years. The estimates are based on the number of developed lots and undeveloped parcels within each study area based on the Assessor's information. The design wastewater flow for each study area was calculated from the undeveloped parcel and acreage data to determine the design number of developed lots.